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Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

MAR 06 2007

REMARKS

Claims 1-36 are pending in this application. Claims 1-36 have been rejected.

The Examiner states the "Applicant's amendment necessitated the new ground(s) of rejection" and therefore the action is final. Applicant's only amendment was to narrow the claims by changing the preamble to use the language "consisting of" instead of "consisting essentially of." Applicants respectfully invite the Examiner to more fully explain how this limited and limiting amendment necessitated the new ground(s) for this rejection.

Rejection under 35 USC 112, first paragraph

Applicants respectfully submit that the current claims are supported by the application as originally filed and as such do reasonable convey to one skilled in the art that the applicant did have possession of the claimed invention. For example, claim 1 does not state the use of a magnetic field and therefore it is possible to later amend the claims to specifically exclude the use of a magnetic field. Applicants have not attempted to broaden the scope of claim 1, in fact, the scope has been limited. As such, Applicants, at the time of the invention, possessed *at least* as much as is now claimed.

The Examiner seems to state as much by saying the "Applicant has narrowed the claim" yet arrives at a conclusion such that even though Applicants were in possession of an invention of broader claims Applicants were not in possession of an invention of narrower claims.

Applicants respectfully request reconsideration and removal of this rejection.

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Rejection under 35 USC 103(a)

The Examiner has rejected Claims 1-7 and 19-25 under 35 U.S.C. 103(a) as being unpatentable over "Theoretical overview of the large-area plasma processing system (LAPPS)" by Manheimer et al. (Manheimer) in view of Collins (US 4509451).

The Examiner states that Manheimer discloses a LAPPS system comprising a sheet electron beam, gas for a plasma, formed plasma, and substrate. The Examiner states that the surface of the substrate is altered by the radical and ion flux and arc controlled based upon the desired pretreatment.

Applicants respectfully submit the following traversal of this rejection. As Applicants have previously submitted, Manheimer is a theoretical discussion of a basic LAPPS system in general. Manheimer does not teach or suggest the current large area metallization pretreatment and surface activation system. Manheimer does not teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate.

Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled "*Theoretical* overview of the large-area plasma processing system (LAPPS)" (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system removes the critical limitations set forth in and

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required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam.

Still furthermore, Manheimer repeatedly, and throughout the theoretical discussion, states the *requirement* of a magnetic field. The current invention does not require a magnetic field, although in some embodiments a magnetic field may be utilized.

In Manheimer, there are multiple references throughout to the *requirement* of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, "*discuss* the production and maintenance of a plasma by a *magnetized* electron beam". (emphasis added) More references include the first full paragraph of page 372 as published "a longitudinal magnetic field *B* is applied" and the next paragraph includes "the magnetic field can be tapered." As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a "need for a magnetic field".

The present application specifically mentions that a magnetic field is *not* required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can be produced "without the beam-collimating magnetic field". Additionally, Figure 4 illustrates a schematic without a magnetic field.

As such, Applicants respectfully submit that the current invention was not discussed in any printed publication.

Claims 1, 8, and 19 have been amended to use the phrase "consisting of". Applicants would like to thank the Examiner for taking the time to discuss this amendment and for

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suggesting that this amendment does exclude the use of a magnetic field and therefore overcomes Manheimer.

Claims 1, 8 and 19 do not contain the limitation of the magnetic field and as such the claimed invention is new, separate, and distinct over the prior art reference.

The Examiner states that "clearly the system of Figure 1 is not a theoretical system and has been utilized by Manheimer to suggest Applicant's system." It appears to Applicants that the Examiner is using Manheimer to support Manheimer. Applicants do not know how the Examiner has arrived at the conclusion that "clearly the system of Figure 1 is not a theoretical system."

Furthermore Applicants submit that Manheimer appears to have tried not using a magnetic field but failed and therefore Collins and Manheimer can not be properly combined.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. (MPEP 2142 and 2143)

The "fact that references *can* be combined or modified is not sufficient to establish prima facie obviousness." (MPEP 2143, emphasis added)

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (In re Royka, 490 F.2d 981) (CCPA 1974) "All words in a claim must be considered in judging the patentability of that claim against prior art." (In re Wilson, 424 F.2d 1382, 1385) (CCPA 1970)

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As discussed herein, Applicants respectfully submit that the references do not contain all the claim limitations of the present application and therefore certainly do not contain the necessary suggestion or motivation to modify or combine any teachings to suggest all the present claim limitations of the present application.

As such Applicants respectfully submit this rejection is obviated and the claims are in condition for allowance.

Applicants respectfully request reconsideration as to, and removal of, the 103(a) rejection.

The Examiner states that Manheimer recognizes that LAPPS has the disadvantage of requiring a magnetic field to confine the beam. The Examiner continues by stating that Manheimer recognizes the need for beams without this disadvantage. The Examiner then notes that Collins teaches an electron beam for producing a sheet plasma for treating the substrate. The Examiner then concludes that it would have been obvious to have modified Manheimer by utilizing an electron beam to produce a sheet plasma without a magnetic field as taught by Collins.

However, Applicants respectfully submit that if this were the case, then Manheimer would have included the teachings of Collins as Manheimer was one skilled in the art and at the time of Manheimer (2000) the teachings of Collins were public as the patent had been issued for more than 15 years (1985). Therefore Applicants respectfully submit that it is evident that the teachings of Collins cannot be combined with the Manheimer reference to result in the presently claimed invention. If Manheimer could have used Collins to avoid the problems Manheimer would have used Collins and not stated explicitly that the need still existed (15 years after

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Collins) for a method to produce a sheet plasma without a magnetic field. The presently claimed invention solves these problems.

Furthermore, Applicants respectfully that the references should not be combined as the Examiner has and even if you do combine the references as the Examiner has, the result would not be as presently claimed in this application. The Examiner has explicitly stated this in paragraph 2 of his Office Action and now appears to be again contradicting himself. The Examiner states that where no magnetic field is utilized there cannot be a separation between the plasma sheet and the substrate.

Applicants respectfully request further explanation as the Examiner appears to be contradicting himself by stating that the present claims cannot be accomplished but then stating that by combining these two references it can be accomplished and therefore it is obvious.

Again, Applicants respectfully submit that if the references are properly combinable that Manheimer, skilled in the art, would have taught using Collins, a 15 year old reference, and not stating that this long-standing problem still exists. In fact, the problem continued to exist and was long-standing, until the current inventors solved this problem as defined in the current application.

The Examiner states that Manheimer indicates that a pretreatment is to be used before conventional plasma processing but does not disclose depositing a layer onto the pretreated substrate. The Examiner also states that Hamada discloses various deposition techniques that can be used after a substrate is pretreated. The Examiner concludes that it would have been obvious to "modify the *invention* of Manheimer" to utilize sputtering or CVD. (emphasis added)

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As previously submitted, Applicants respectfully submit that Manheimer does not teach an invention. Rather, Manheimer is a theoretical discussion as is evidenced by the title of the article as well as the language of the discussion as used throughout Manheimer.

As previously stated, Manheimer is a theoretical discussion of a basic LAPPS system in general. Manheimer does not teach or suggest the current large area metallization pretreatment and surface activation system. Manheimer does not teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate.

Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled "*Theoretical overview of the large-area plasma processing system (LAPPS)*" (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system *removes* the critical limitations set forth in and required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam. Additionally, Manheimer repeatedly, and throughout the theoretical discussion, states the *requirement* of a magnetic field. The current invention does *not* require a magnetic field, although in some embodiments a magnetic field may be utilized.

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In Manheimer, there are multiple references throughout to the *requirement* of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, “*discuss* the production and maintenance of a plasma by a *magnetized* electron beam”. (emphasis added) More references include the first full paragraph of page 372 as published “a longitudinal magnetic field *B* is applied” and the next paragraph includes “the magnetic field can be tapered.” As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a “need for a magnetic field”.

The present application specifically mentions that a magnetic field is *not* required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can be produced “without the beam-collimating magnetic field”. Additionally, Figure 4 illustrates a schematic without a magnetic field.

Claims 1, 8, and 19 have been amended to use the phrase “consisting essentially of”. Again, Applicants would like to thank the Examiner for taking the time to discuss this amendment.

Claims 1, 8 and 19 do not contain the limitation of the magnetic field and as such the claimed invention is new, separate, and distinct over the prior art reference.

Therefore, Applicants respectfully submit that the 103(a) rejection has been successfully traversed and that all the claims are in condition for allowance. Applicants respectfully request reconsideration as to, and removal of, the 103(a) rejection.

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Applicants respectfully submit that Collins and Manheimer are not enabling disclosures, there is no motivation to combine the two, and that the references in fact teach away from the present invention. The claims of the present invention have limitations not found in the prior art and therefore are patentably distinguishable over the prior art.

The Examiner has rejected Claims 15 and 33 under 35 U.S.C. 103(a) as being unpatentable over "Theoretical overview of the large-area plasma processing system (LAPPS)" by Manheimer et al. (Manheimer) in view of Collins and US 5,089,066 to Hamada et al. (Hamada) as applied to claims 14 and 32 above, and further in view of US 5,178,739 to Barnes et al. (Barnes).

The Examiner states that it would have been obvious to "modify the *invention* of Manheimer" in view of Hamada to utilize magnetrons. (emphasis added)

Again, Applicants respectfully submit that Manheimer does not teach an invention. Rather, Manheimer is a theoretical discussion as is evidenced by the title of the article as well as the language of the discussion as used throughout Manheimer.

As previously stated, Manheimer is a theoretical discussion of a basic LAPPS system in general. Manheimer does not teach or suggest the current large area metallization pretreatment and surface activation system. Manheimer does not teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate.

Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled "*Theoretical overview of the large-area plasma processing system (LAPPS)*" (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area

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metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system removes the critical limitations set forth in and required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam. Additionally, Manheimer repeatedly, and throughout the theoretical discussion, states the requirement of a magnetic field. The current invention does not require a magnetic field, although in some embodiments a magnetic field may be utilized.

In Manheimer, there are multiple references throughout to the *requirement* of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, "*discuss* the production and maintenance of a plasma by a *magnetized* electron beam". (emphasis added) More references include the first full paragraph of page 372 as published "a longitudinal magnetic field *B* is applied" and the next paragraph includes "the magnetic field can be tapered." As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a "need for a magnetic field".

The present application specifically mentions that a magnetic field is *not* required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can

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be produced "without the beam-collimating magnetic field". Additionally, Figure 4 illustrates a schematic *without* a magnetic field.

Claims 1, 8 and 19 do not contain the limitation of the magnetic field and as such the claimed invention is new, separate, and distinct over the prior art reference.

The Examiner states that "clearly the system of Figure 1 is not a theoretical system and has been utilized by Manheimer to suggest Applicant's system." It appears to Applicants that the Examiner is using Manheimer to support Manheimer. Applicants do not know how the Examiner has arrived at the conclusion that "clearly the system of Figure 1 is not a theoretical system."

Furthermore Applicants submit that Manheimer appears to have tried not using a magnetic field but failed and therefore Collins and Manheimer can not be properly combined.

Furthermore, Applicants respectfully submit that since claim 15 depends from the allowable claim 14, that claim 15 is therefore in condition for allowance and the rejection under 35 U.S.C. 103 is obviated. Similarly, claim 33 depends from claim 32 and since claim 32 depends from claim 19 and since claim 19 is in condition for allowance, Applicants respectfully submit that claim 33 is also in condition for allowance and the rejection under 35 U.S.C. 103 is obviated.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference or to combine the reference

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teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. (MPEP 2142 and 2143)

The “fact that references *can* be combined or modified is not sufficient to establish prima facie obviousness.” (MPEP 2143, emphasis added)

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As discussed herein, Applicants respectfully submit that the references do not contain all the claim limitations of the present application and therefore certainly do not contain the necessary suggestion or motivation to modify or combine any teachings to suggest all the present claim limitations of the present application.

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Rejection under 35 USC 103(a)

The Examiner has rejected Claims 8-14, 16-18, 26-32, and 34-36 under 35 U.S.C. 103(a) as being unpatentable over "Theoretical overview of the large-area plasma processing system (LAPPS)" by Manheimer et al. (Manheimer) in view of Collins and further in view of US 5,089,066 to Hamada et al. (Hamada).

The Examiner states that Manheimer indicates that a pretreatment is to be used before conventional plasma processing but does not disclose depositing a layer onto the pretreated substrate. The Examiner also states that Hamada discloses various deposition techniques that can be used after a substrate is pretreated. The Examiner concludes that it would have been obvious to "modify the *invention* of Manheimer" to utilize sputtering of CVD. (emphasis added)

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Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled "*Theoretical* overview of the large-area plasma processing system (LAPPS)" (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to

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adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system *removes* the critical limitations set forth in and required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam. Additionally, Manheimer repeatedly, and throughout the theoretical discussion, states the *requirement* of a magnetic field. The current invention does *not* require a magnetic field, although in some embodiments a magnetic field may be utilized.

In Manheimer, there are multiple references throughout to the *requirement* of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, “*discuss* the production and maintenance of a plasma by a *magnetized* electron beam”. (emphasis added) More references include the first full paragraph of page 372 as published “a longitudinal magnetic field *B* is applied” and the next paragraph includes “the magnetic field can be tapered.” As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a “need for a magnetic field”.

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Claims 1, 8, and 19 have been amended to use the phrase "consisting essentially of". Again, Applicants would like to thank the Examiner for taking the time to discuss this amendment.

Claims 1, 8 and 19 do not contain the limitation of the magnetic field and as such the claimed invention is new, separate, and distinct over the prior art reference.

Therefore, Applicants respectfully submit that the 103(a) rejection has been successfully traversed and that claims 8-14, 16-18, 26-32, and 34-36 are in condition for allowance. Applicants respectfully request reconsideration as to, and removal of, the 103(a) rejection.

The Examiner has rejected Claims 15 and 33 under 35 U.S.C. 103(a) as being unpatentable over "Theoretical overview of the large-area plasma processing system (LAPPS)" by Manheimer et al. (Manheimer) in view of Collins and further in view of US 5,089,066 to Hamada et al. (Hamada) as applied to claims 14 and 32 above, and further in view of US 5,178,739 to Barnes et al. (Barnes).

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these references are listed throughout and include a specific reference in the Summary section when the authors state there is a "need for a magnetic field".

The present application specifically mentions that a magnetic field is *not* required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can be produced "without the beam-collimating magnetic field". Additionally, Figure 4 illustrates a schematic *without* a magnetic field.

Furthermore, Applicants respectfully submit that since claim 15 depends from the allowable claim 14, that claim 15 is therefore in condition for allowance and the rejection under 35 U.S.C. 103 is obviated. Similarly, claim 33 depends from claim 32 and since claim 32 depends from claim 19 and since claim 19 is in condition for allowance, Applicants respectfully submit that claim 33 is also in condition for allowance and the rejection under 35 U.S.C. 103 is obviated.

Claims 1, 8 and 19 do not contain the limitation of the magnetic field and as such the claimed invention is new, separate, and distinct over the prior art reference.

The Examiner states that "clearly the system of Figure 1 is not a theoretical system and has been utilized by Manheimer to suggest Applicant's system." It appears to Applicants that the Examiner is using Manheimer to support Manheimer. Applicants do not know how the Examiner has arrived at the conclusion that "clearly the system of Figure 1 is not a theoretical system."

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To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. (MPEP 2142 and 2143)

The “fact that references *can* be combined or modified is not sufficient to establish *prima facie* obviousness.” (MPEP 2143, emphasis added)

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (In re Royka, 490 F.2d 981) (CCPA 1974) “All words in a claim must be considered in judging the patentability of that claim against prior art.” (In re Wilson, 424 F.2d 1382, 1385) (CCPA 1970)

As discussed herein, Applicants respectfully submit that the references do not contain all the claim limitations of the present application and therefore certainly do not contain the necessary suggestion or motivation to modify or combine any teachings to suggest all the present claim limitations of the present application.

As such Applicants respectfully submit this rejection is obviated and the claims are in condition for allowance.

As described in MPEP 2141.02, “the claimed invention as a whole *must* be considered.” (emphasis added) “The question under 35 USC 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious.”

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Applicants respectfully submit that the Examiner has focused on the differences between the invention and the prior art references. The Examiner has compiled a series of prior art references, each addressing an individual difference between the claimed invention and the prior art. This is contrary to the teachings of the MPEP, which clearly states that "the claimed invention as a whole" should be considered and "not whether the differences themselves would have been obvious." (MPEP 2141.02)

As described in MPEP 2141.02 section V., "obviousness cannot be predicated on what is not known at the time an invention is made even if the inherency of a certain feature is later established."

As described in MPEP 2142, "impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art."

Applicants respectfully submit that the Examiner has improperly applied hindsight in reaching the conclusion. Applicants respectfully submit that, at the time of the invention, it was not obvious to compile and combine the references as described by the Examiner. Rather, hindsight may make it appear as though the references would have been sufficient to make the claimed invention obvious, however, hindsight is impermissible, as stated in MPEP 2142.

As described in MPEP 2143, in order to establish a prima facie case of obviousness, "there must be some suggestion or motivation...to modify the reference or to combine the reference teachings" and "there must be a reasonable expectation of success." Furthermore, the MPEP states that "the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure."

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Applicants respectfully submit that the references do not provide the required motivation to combine nor do the references provide any reasonable expectation of success.

According to MPEP 2143 section IV, "the level of skill in the art cannot be relied upon to provide the suggestion to combine references."

Applicants again respectfully submit that the references do not provide the required motivation to combine nor do the references provide any reasonable expectation of success.

According to MPEP 2143.02, "predictability is determined at the time the invention was made."

As explained earlier, Applicants respectfully submit that hindsight is impermissible in determining predictability and obviousness. Applicants respectfully submit that at the time of the invention, no suggestion to combine the references existed and furthermore that no reasonable expectation was provided from the references. Therefore, Applicants respectfully submit that the claimed invention was non-obvious and that the claims are in condition for allowance.

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Double Patenting

Applicants have enclosed a terminal disclaimer.

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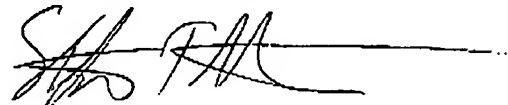
Conclusion

In conclusion, Applicants thank the Examiner for his comments and suggestions for amending the claims as Applicants have. Whereas Applicants were in possession of the description of Claim 1 as of the original filing date and as the language of Claim 1 is limited and specifically excludes the use of a magnetic field, and whereas the prior art discusses the requirement of a magnetic field and therefore *teaches away* from the claimed invention, Applicants respectfully submit that the Examiner's Office Action has been fully responded to and that the claims are in condition for allowance. In the furtherance of compact prosecution, if a personal or telephone interview would help expedite matters, the Examiner is requested to contact Steve Hunnius at 202-404-1554.

Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 50-0281.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



Stephen T. Hunnius
Reg. No. 48,304
Naval Research Laboratory
Code 1008.2
4555 Overlook Avenue, S.W.
Washington, D.C. 20375-5325